

The New Bleachers

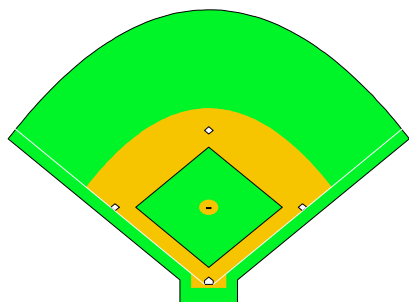
Middle Level

Math Performance Event

by Chris Garstang

MAP Team Member

Dixon School District  
South Central MAP Region



# The New Bleachers

**Purpose:** This performance event will strengthen the students' ability to measure for total area, calculate cost, and solve detailed problems. The student is expected to find the total cost for replacing the wooden seats on the school's bleachers by determining how much lumber, how many bolts, and how much paint are needed. Based on the amounts of the various materials needed, the student must determine total cost.

## **Show-Me Standards Addressed:**

Knowledge: M1, M2

Performance: 3.4, 3.8

**Grade Level Range:** Middle Level (Grades 7-9)

**Subject Area:** Math

## **Materials and Resources Needed:**

Pencil, Student Performance Event Packet: including Student Prompt, The Bleachers and Materials Information Sheet, the Student Scoring Guide, and the Student Response Sheet.

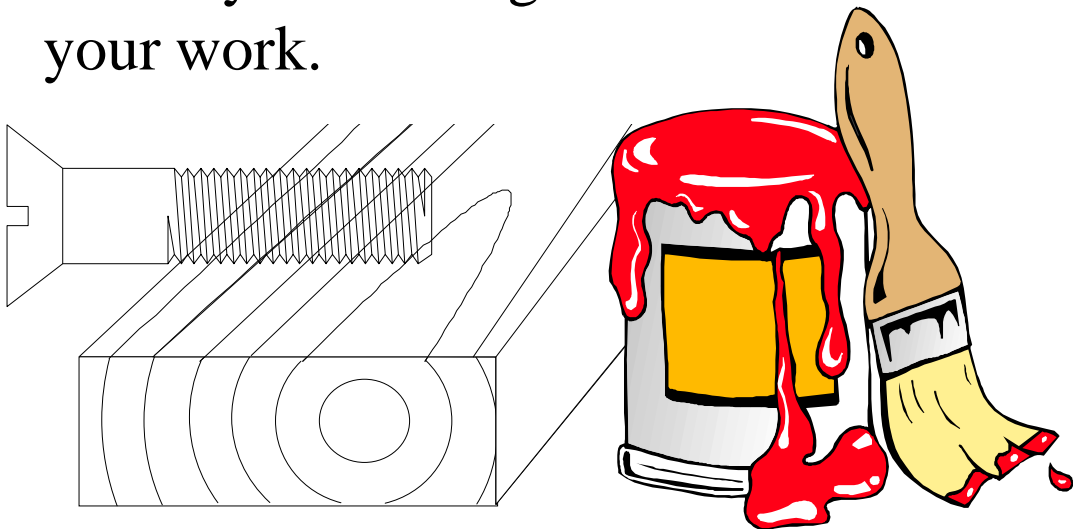
**Time Needed for Event:** 45-60 minutes

**Instructions for Administration:** Provide students with a Student Performance Event Packet. Make sure they understand the directions within the student prompt and tell them they will need to refer to the Bleachers and Materials Information Sheet to get the measurements of the bleacher seats and the cost of the various materials. Tell students they will need to use the Student Response Sheet to show their work in the space provided, complete the chart, and record the estimated price of the total cost to replace the bleacher seats. Also, they will need to write the process used to find their answer.

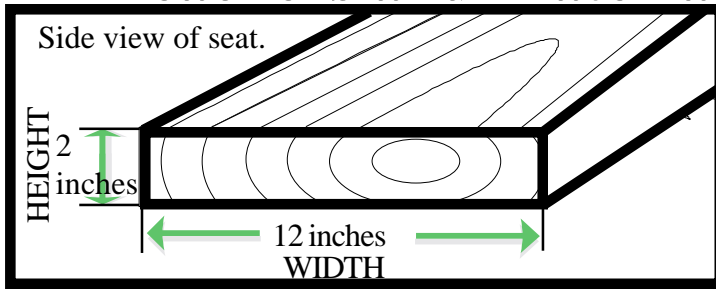
**Pre-assessment Instructions:** Students will have to have the prerequisite knowledge of finding total area, computational skills of addition, subtraction, multiplication, and division. A brief warm-up activity in finding area is suggested prior to the administration of this activity.

# The New Bleachers

The School Board has ask the class to give a written estimate for the cost of replacing the wooden seats on the school's bleachers. You will need to calculate how much lumber, how many bolts, and how much paint will be needed to replace the existing seats of the bleachers. Based on the amounts of the various materials needed, you will need to figure the total cost. Use the Bleacher and Materials Information Sheet to help you in deriving the estimated total cost. You will use the Student Response Sheet to record your findings. Be sure to show your work.

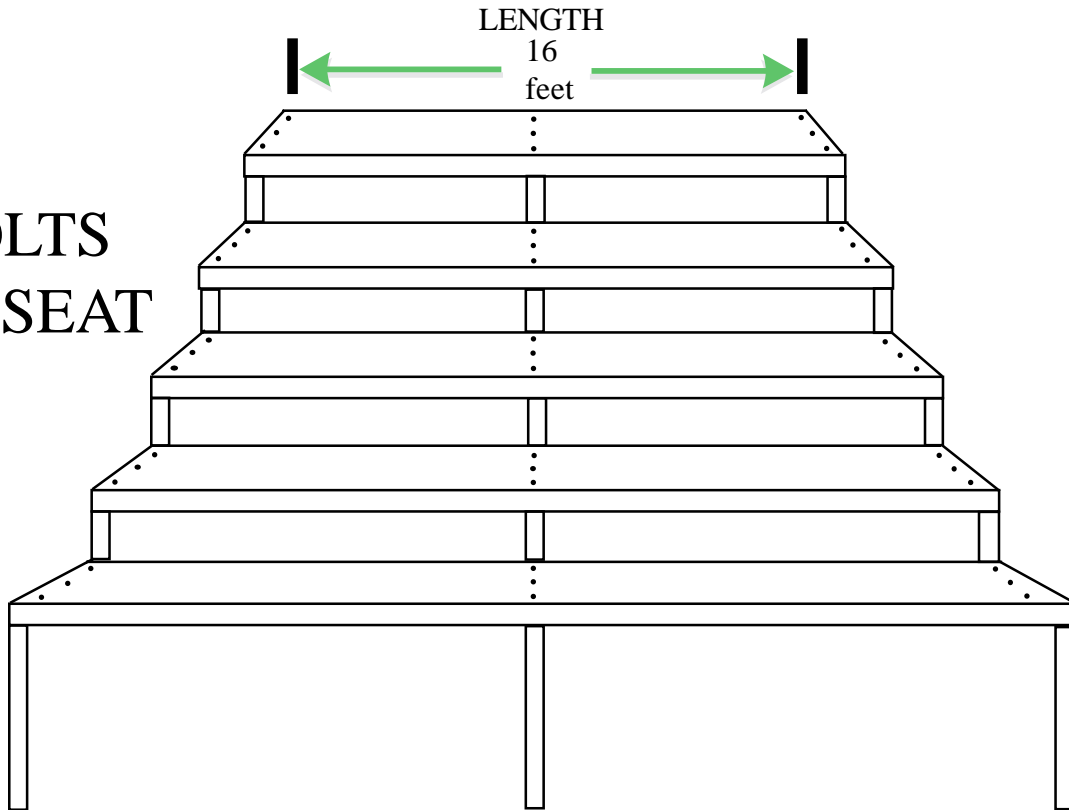


# Bleachers and Materials: Information Sheet



## The Bleachers

9 BOLTS  
PER SEAT

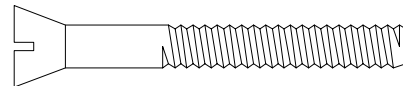


### Price List from the Hardware Store

#### Lumber Prices

height inches	width inches	price per linear foot
1	2	\$0.25
1	3	\$0.30
1	4	\$0.35
1	5	\$0.40
1	6	\$0.45
1	7	\$0.50
1	8	\$0.55
1	9	\$0.60
1	10	\$0.65
1	11	\$0.70
1	12	\$0.75

height inches	width inches	price per linear foot
2	2	\$0.40
2	3	\$0.45
2	4	\$0.50
2	5	\$0.55
2	6	\$0.60
2	7	\$0.65
2	8	\$0.70
2	9	\$0.75
2	10	\$0.80
2	11	\$0.85
2	12	\$0.90



Bolt Length	Cost
1 in.	\$0.35 each
1.5 in.	\$0.43 each
2 in.	\$0.50 each
2.5 in	\$0.55 each
3 in	\$0.60 each



Our finest outside  
paint covers 400  
square feet.

\$9.00 per  
gallon

## Student Work Sheet

Use your knowledge to find the total cost for replacing the school's bleachers' seats. The space below has been provided to do the needed calculations.

**Use the chart to write your findings and provide the estimated total price for replacing the bleachers' seats.**

Description of Material	Amount Needed	Price per Unit	Total Cost
Lumber			
Bolts			
Paint			
<b>Total</b>			

**Write the process you used to find the total cost for replacing the bleachers' seats.**

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Description of Material	Amount Needed	Price per Unit	Total Cost
Lumber			
Bolts			
Paint			

[illegible]

# Teachers' Scoring Guide

Criteria to be assessed	Exemplary	Acceptable	Partial Success	Little or No Understanding
The student has the mathematical skills of finding area and doing the needed calculations to find the estimated cost of replacing the seats of the school's bleachers.	The student has thoroughly demonstrated the needed skills to solve the problem.	The student has sufficiently demonstrated the needed skills to solve the problem with only minor errors.	The student has partially demonstrated the needed skills to solve the problem with major errors.	The student has no understanding of the needed skills to solve the problem.
The response shows an estimated cost for replacing the seats of the school's bleachers.	The estimated cost is reasonable based on a complete, accurate, and focused solution process.	The estimated cost is reasonable based on the use of a valid solution process that is, for the most part, accurate but may lack focus at one or two points in the process.	The estimated cost is unreasonable based on the use of a solution process that demonstrates fragmentation or partial understanding.	The estimated cost is far fetched or unreasonable due to little or no understanding of how to go about solving the problem.
The solution process has been communicated.	The student's explanation of the solution process is clear, accurate, complete, and logical.	The student's explanation of the solution process is generally complete and, for the most part, logical, although it may be difficult to understand at one or two points.	The student's explanation of the solution process may be general and lacking in detail; it may be somewhat illogical and difficult to follow.	The student's explanation of the solution process may be completely illogical and/or difficult to follow.

## Student's Scoring Guide

Criteria to be assessed	Exemplary	Acceptable	Partial Success	Little or No Understanding
I have mathematical skills of finding area and doing the needed calculations to find the estimated cost of replacing the seats of the school's bleachers.	I have thoroughly demonstrated the needed skills to solve the problem.	I have sufficiently demonstrated the needed skills to solve the problem with only minor errors.	I have partially demonstrated the needed skills to solve the problem with major errors.	I have no understanding of the needed skills to solve the problem.
My response shows an estimated cost for replacing the seats of the school's bleachers.	My estimated cost is correct based on a complete, accurate, and focused solution process.	My estimated cost is reasonable and based on the use of a valid solution process that is, for the most part, accurate but may lose focus at one or two points..	My estimated cost is unreasonable based on the use of a solution process that demonstrates fragmentation or partial understanding.	My estimated cost is far fetched or unreasonable due to little or no understanding of how to go about solving the problem.
My solution process has been communicated.	My explanation of the solution process is clear, accurate, complete, and logical.	My explanation of the solution process is generally complete and, for the most part, logical, although it may be difficult to understand at one or two points.	My explanation of the solution process may be general and lacking in detail; it may be somewhat illogical and difficult to follow.	My explanation of the solution process may be completely illogical and or difficult to follow.